

REMARKS

Claims 26-29, 31, 34, 35, 39, 41, 42, 45, 52-55, 58-60, 63-65, and 93-112 are pending in the subject application. Claims 26, 28, 29, and 95 are amended herein. Applicants submit that the amendments introduce no new matter, support therefor being found in the original application and claims as filed. Applicants appreciate the Examiner's thorough examination of the subject application and request reconsideration based on the amendments and the following remarks.

1. 35 U.S.C. §103 Rejections

Claims 26-29, 31, 34, 52-53, 58-60, 63-65, 93-98, 103-104, and 107-112 are rejected under 35 U.S.C. §103(a) over Jackson (US 5,213,619) and Kowanko (US 6,036,918). Claims 39 and 99 are rejected under 35 U.S.C. §103(a) over Jackson, Kowanko, and Caputo (US 5,244,629). Claims 41-42, 45, 54-55, 100-102, and 105-106 are rejected under 35 U.S.C. §103(a) over Jackson, Kowanko, and Chao (US 5,996,155). Applicants respectfully traverse.

Applicants teach a method for cleaning, disinfecting and/or sterilizing a substrate using a substantially non-aqueous fluid comprising percarbonic acid. In particular, according to Applicants' method, the substantially non-aqueous fluid comprising percarbonic acid is first formed. After formation of the substantially non-aqueous fluid, the substrate is then contacted with the substantially non-aqueous fluid under conditions conducive to removing contaminants from the substrate, disinfecting and/or sterilizing the substrate.

The Office asserts that Jackson teaches a method of cleaning and sterilizing a substrate by contacting it with carbon dioxide dense fluid mixed with hydrogen peroxide (pointing to col. 5, lines 19-22 and col. 9, lines 31-62), noting that these materials are components of percarbonic acid.

The Office acknowledges that Jackson does not disclose a method wherein a substrate is contacted with a substantially non-aqueous fluid.

Applicants further respectfully submit that Jackson's process is different than that presently claimed by Applicants. Nowhere does Jackson teach or suggest a method wherein a substantially non-aqueous fluid comprising percarbonic acid is first formed and, thereafter, the substrate is contacted with the substantially non-aqueous fluid.

In the passage relied upon by the Office, Jackson describes a method wherein a chemical oxidizing agent is transported into the cleaning chamber as an admixture with a dense fluid. For example, a carbon dioxide-hydrogen peroxide fluid mixture is injected into the cleaning chamber. As pointed out by Jackson, hydrogen peroxide used in combination with dense carbon dioxide provides particular advantages because it enhances dense carbon dioxide's cleaning qualities, is an excellent biocide, and decomposes into innocuous by-products during high energy decomposition. As further pointed out, unlike carbon dioxide, hydrogen peroxide has a large dipole and low dielectric strength. As such, a mixture of carbon dioxide and hydrogen peroxide in varying ratios possess a wide range of hydrogen bonding, polar, and dipole energy contributions, hence solubility chemistries. As set out, the hydrogen peroxide (chemical oxidizing agent) is provided so as to produce oxidizing species or radicals under the conditions employed. According to Jackson, during the cleaning process under the high energy conditions employed, the hydrogen peroxide component of the mixture chemically degrades into highly active atomic oxygen, hydroxyl and hydrogen radicals. Thus, the hydrogen peroxide serves as a dense fluid solvent modifier, cleaning solvent, oxidant, and biocide in such mixtures. (See col. 9, line 31 – col. 10, line 18)

It is submitted that, clearly, as described above, Jackson does not teach or suggest a method wherein percarbonic acid is formed or is used to clean/sterilize/disinfect a substrate. Rather, according to Jackson, a mixture of dense carbon dioxide and hydrogen peroxide is used to clean/sterilize/disinfect a substrate.

Each component of the mixture (i.e. hydrogen peroxide and carbon dioxide) contributes its individual properties, with the hydrogen peroxide enhancing dense carbon dioxide's cleaning qualities, and with the carbon dioxide and hydrogen peroxide each acting to clean/sterilize/disinfect the substrate. This is in contrast to Applicant's claimed method wherein percarbonic acid is formed and wherein percarbonic acid contacts and cleans/sterilizes/disinfects. Clearly, Jackson does not teach or suggest a method wherein a percarbonic acid is formed and wherein the substrate is contacted with the percarbonic acid.

Thus, it is submitted that Applicants' independent claims 26, 28, 29, and 95 are patentable over Jackson.

Applicants further submit that no combination of Jackson and Kowanko would teach or suggest Applicants' claimed invention.

The Office points to Kowanko and asserts that Kowanko "teaches a method of sterilization in which a substantially non-aqueous fluid (vapor, essentially free from any liquid) comprising a peracid (percarbonic is a specific form of a peracid) contacts a substrate under conditions conducive to removing contaminants." The Office asserts that it would have been obvious to modify Jackson to include the percarbonic acid to be provided in a substantially non-aqueous form as taught by Kowanko.

Applicants respectfully disagree. As set out, Jackson specifically teaches the use of admixtures of a dense liquid and a chemical oxidizing agent wherein each component of the mixture (i.e. hydrogen peroxide and carbon dioxide) contributes, with the hydrogen peroxide enhancing dense carbon dioxide's cleaning qualities, and with the carbon dioxide and hydrogen peroxide each acting to clean/sterilize/disinfect the substrate. There would be no teaching or suggestion to replace Jackson's teaching of an admixture, which under the cleaning conditions taught by Jackson work synergistically, with a single material. There also is no teaching or suggestion to further

modify Jackson to provide a substantially non-aqueous cleaning material. For example, Jackson describes particular materials and cleaning conditions that combine so as to provide the improved cleaning capabilities described. One cannot simply substitute into Jackson's method pieces of Kowanko which describes cleaning using a different material, mechanism, and cleaning conditions. There is no teaching to do so nor would there be a reasonable expectation of success.

Thus, claims 26, 28, 29, 95, and all claims dependent therefrom, are patentable over Jackson and Kowanko. Reconsideration and withdrawal of the rejection is respectfully requested.

Caputo is cited for allegedly describing a sterilizing process that uses a UV irradiated and weakly ionized plasma. However, Caputo does not remedy the above-noted deficiencies in Jackson and Kowanko.

Thus, claims 26, 28, 29, 95, and all claims dependent therefrom, are patentable over Jackson, Kowanko, and Caputo. Reconsideration and withdrawal of the rejection is respectfully requested.

Chao is cited for allegedly describing sterilization within a chamber wherein a substrate is contacted with a liquid while being exposed to an ultraviolet radiation source. However, Chao does not remedy the above-noted deficiencies in Jackson and Kowanko.

Thus, claims 26, 28, 29, 95, and all claims dependent therefrom, are patentable over Jackson Kowanko, and Chao. Reconsideration and withdrawal of the rejection is respectfully requested.

CONCLUSION

It is respectfully submitted that the subject application is in a condition for allowance. Early and favorable action is requested. If for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge Deposit Account No. 04-1105.

Dated: October 27, 2009

Respectfully submitted,

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